



## Low-emission power generation in Malta

*SAACKE equips Floating Storage Unit (FSU) with low NO<sub>x</sub> dual-fuel system*

Up until the late summer of 2016, electricity for the over 400,000 inhabitants of Malta was still being produced by oil-fired power plants. ElectroGas Malta Ltd commissioned Bumi Armada Berhad, a Malaysia-based international offshore energy facilities and services provider to convert an LNG tanker into a Floating Storage Unit (FSU) for lower emission and more efficient power generation. Today, the "Armada LNG Mediterranean" with a volume of 125,000 m<sup>3</sup> serves as a storage facility for liquefied natural gas and permanently supplies LNG to the Delimara onshore regasification plant. As part of this major project, Bumi Armada ordered two SAACKE D-type FMB-VD boilers, each with a capacity of 20 tons of superheated steam per hour. The low NO<sub>x</sub> design guarantees the lowest emission values of 100 mg/m<sup>3</sup> in gas operation and 450 mg/m<sup>3</sup> in oil operation, which means that the strict statutory requirements for operation at the supply pier can be safely met.

### Compact solution in the shortest possible time

The project's time and space requirements were a further challenge: Only nine months were available for the entire implementation between the signing of the contract and initial operation. Just two weeks were available for implementation in the dry dock. In addition, the narrow installation slot required a compact boiler, which is why SAACKE adapted the components individually to the dimensions of the ship's engine room.



*„SAACKE works efficiently, competently and in a service-oriented manner. I would not hesitate to work with these experts again at the next opportunity.“*

*Gianluca Orlandi, Project Manager at Bumi Armada*

**Bumi Armada Berhad / ElectroGas Malta**

**Floating Storage Unit (FSU)**

**Complete dual-fuel combustion system**

## Task

Implementation of a low-emission and compact dual-fuel combustion system on a FSU with the shortest possible project duration for efficient onshore power generation using LNG.

## Solution

SAACKE FMB-VD boiler including DDZ-G burner and other customized components from a single source, jointly implemented by several international company locations within nine months.

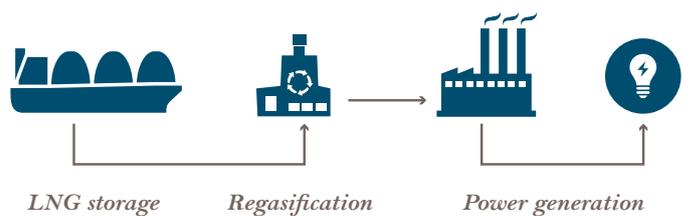
### The SAACKE solution in detail

In addition to the two low NO<sub>x</sub> boilers with superheaters and flue gas recirculation, the scope of services included four vapor coolers, a feedwater pump assembly and two DDZ-G burners. SAACKE also supplied all other components of a complete dual-fuel combustion system from a single source – ranging from fans, Gas Valve Units (GVU) and oil fittings to boiler control cabinets. Good networking and well coordinated cooperation among the international SAACKE locations played a decisive role here: While the representation office in Singapore ensured close contact with the customer in Malaysia, the two boilers were designed in Kiel and produced at SAACKE's Chinese production facility in Qingdao. The superheaters were fabricated in Croatia and the burners were manufactured by the experts at the Bremen headquarters in northern Germany, where the project coordination was also located.

### Summary

A challenging schedule, compliance with stringent emissions regulations and adherence to the compact dimensions – SAACKE was able to master all of these challenges within the scope of the FSU project. For this reason too ElectroGas Malta proudly regards the implementation as a milestone in the local energy supply. Emissions were cut by 50% and fine particulate formation by 93%, while efficiency increased by half. The company received the award for Best European Energy Project 2015.

### From LNG to electricity



### Technical data: FSU Armada LNG Mediterrana

Unit capacity	20 t/h at 20 bar and 260°C
Steam cooling	10 t/h and 18 t/h
Burner capacity	16.4 MW fuel gas, 16.2 MW MDO / MGO
Low NO <sub>x</sub> emissions	100 mg/m <sup>3</sup> in gas operation, 450 mg/m <sup>3</sup> in oil operation
Gas Valve Units	Compliant with IGC Code, explosion protection of Zone 1 according to ATEX 2014/34/EU, maximum inlet pressure of 0.5 bar

### All benefits at a glance

- ✔ Customized system including all components from a single source
- ✔ Low NO<sub>x</sub> technology "Made in Germany" guarantees compliance with the most stringent emissions values in gas and oil operation
- ✔ Compact and made-to-measure boiler solution for limited ship infrastructure
- ✔ Maximum explosion protection through Gas Valve Units
- ✔ International project implementation in the shortest possible time

